Appendix G

Values of Condition Estimates in Common MAIA and EMAP Indicators

Table G-1. Changes in Environmental Conditions Measured Between the 1990-1993 EMAP-VP and 1997 MAIA-E Studies. Change was calculated as the difference in condition estimates (the percent of the estuarine area that exceeds a designated value of impairment). This difference is considered to be statistically significant if the 95% confidence intervals of the MAIA-E AND EMAP-VP condition estimates were non-overlapping. Red entries indicate a degradation of condition over time; green designates improvement; and the absence of color signifies that the estimate ranges overlap (interpretations regarding change are inconclusive because of measurement uncertainty).

EMAP data: Percent Area degraded ± 95% confidence interval (CI)

Delaware Estuary	Bottom DO ≤ 5 mg/L	Bottom DO ≤ 2 mg/L	Metals * in Sediment	Organics * in Sediment	Sed Toxicity ≤ 60%	Sed Toxicity ≤ 80%	Benthic Community Condition **
Overall	0 ± 0	3.3 ± 4.1	0.8 ± 2.7	0.2 ± 1.4	1.1 ± 2	1.8 ± 2.4	24.4 ± 11.6
Bay	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	0 ± 0	17.7 ± 17
River	0 ± 0	23.2 ± 34.8	7 ± 22.2	**2 ± 11.4**	9.2 ± 16.5	15.4 ± 20.1	69.6 ± 21.1
Chesapeake Bay							
Overall	10 ± 3.2	31.1 ± 4.6	**5.2 ± 3.1**	2.7 ± 1.9	0 ± 0	**6.1 ± 3**	**23.4 ± 4.8**
Mainstem	11.1 ± 4.8	37.3 ± 7.1	**5.2 ± 4.2**	3.8 ± 4.5	0 ± 0	**6.6 ± 5.8**	18.9 ± 5.9
Potomac River	24.5 ± 11.6	24.7 ± 11.6	**0.2 ± 0**	0 ± 0	0 ± 0	1 ± 0	44.1 ± 22
Rappahannock River	15.3 ± 11.1	39 ± 20.4	0 ± 0	16.8 ± 17.1	0 ± 0	8.9 ± 10.6	43.9 ± 32.7
James River	0 ± 0	3.9 ± 0	7.6 ± 10.1	0 ± 0	0 ± 0	8 ± 11.4	19.2 ± 23.4

MAIA data: Percent Area degraded ± 95% confidence interval (CI)

Delaware Estuary	Bottom DO ≤ 5 mg/L	Bottom DO ≤ 2 mg/L	Metals * in Sediment	Organics * in Sediment	Sed Toxicity ≤ 60%	Sed Toxicity ≤ 80%	Benthic Community Condition **
Overall	0 ± 0	1.3 ± 1.2	3.3 ± 1.2	4 ± 1.1	1.8 ± 2.1	1.8 ± 2.1	35.7 ± 14.3
Bay	0 ± 0	0 ± 0	0.5 ± 0.5	0 ± 0	0 ± 0	0 ± 0	35.9 ± 16.4
River	0 ± 0	10.8 ± 10.3	23.7 ± 9.3	**33.5 ± 9.6**	14.9 ± 17.8	14.9 ± 17.8	37.9 ± 10.6
Chesapeake Bay							
Overall	19.4 ± 7.5	36.7 ± 8.5	**22 ± 5.4**	2.2 ± 1.9	0.3 ± 0.3	**0.3 ± 0.3**	**37 ± 5**
Mainstem	24.6 ± 16.2	44.8 ± 17.9	**26.8 ± 7.3**	3.4 ± 3.3	0 ± 0	**0 ± 0**	28.6 ± 5.4
Potomac River	12.2 ± 23.8	25.2 ± 31.2	**28.6 ± 12.1**	0 ± 0	0 ± 0	0 ± 0	56 ± 9.8
Rappahannock River	16.7 ± 21.3	33.3 ± 26.9	0 ± 0	0 ± 0	0 ± 0	0 ± 0	32 ± 9
James River	0 ± 0	5.3 ± 10	0 ± 0	0 ± 0	0 ± 0	0 ± 0	32 ± 9.1

Change in degraded area between EMAP & MAIA studies: (MAIA - EMAP) ± sum of CIs
Value is significant when it exceeds the sum of the confidence intervals (positive value of estimate = degradation).

Delaware Estuary	Bottom DO ≤ 5 mg/L	Bottom DO ≤ 2 mg/L	Metals * in Sediment	Organics * in Sediment	Sed Toxicity ≤ 60%	Sed Toxicity ≤ 80%	Benthic Community Condition **
Overall	0 ± 0	-2 ± 5.3	2.5 ± 3.9	3.8 ± 2.5	0.7 ± 4.1	0 ± 4.5	11.3 ± 25.9
Bay	0 ± 0	0 ± 0	0.5 ± 0.5	0 ± 0	0 ± 0	0 ± 0	18.2 ± 33.4
River	0 ± 0	-12.4 ± 45.1	16.7 ± 31.5	**31.5 ± 21**	5.7 ± 34.3	-0.5 ± 37.9	-31.7 ± 31.7
Chesapeake Bay							
Overall	9.4 ± 10.7	5.6 ± 13.1	**16.8 ± 8.5**	-0.5 ± 3.8	0.3 ± 0.3	**-5.8 ± 3.3**	**13.6 ± 9.8**
Mainstem	13.5 ± 21	7.5 ± 25	**21.6 ± 11.5**	-0.4 ± 7.8	0 ± 0	**-6.6 ± 5.8**	9.7 ± 11.3
Potomac River	-12.3 ± 35.4	0.5 ± 42.8	**28.4 ± 12.1**	0 ± 0	0 ± 0	-1 ± 0	11.9 ± 31.8
Rappahannock River	1.4 ± 32.4	-5.7 ± 47.3	0 ± 0	-16.8 ± 17.1	0 ± 0	-8.9 ± 10.6	-11.9 ± 41.7
James River	0 ± 0	1.4 ± 10	-7.6 ± 10.1	0 ± 0	0 ± 0	-8 ± 11.4	12.8 ± 32.5

* the percent estuarine area exceeding at least one ERM value
** the percent estuarine area exhibiting a benthic index value of zero or less